

## MULTILEVEL COPPER INTERCONNECT WITH LOW-K DIELECTRICS AND AIR GAPS

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### Abstract of the Disclosure

Structures and methods are provided for an improved multilevel wiring interconnect in an integrated circuit assembly. The present invention provides for a multilayer copper wiring structure by electroless, selectively deposited copper in a streamlined process which further reduces both intra-level line to line capacitance  
10 and the inter-level capacitance.

In particular, an illustrative embodiment of the present invention includes a novel methodology for forming multilevel wiring interconnects in an integrated circuit assembly. The method includes forming a number of multilayer metal lines, e.g. copper lines formed by selective electroless plating, separated by air gaps above  
15 a substrate. A low dielectric constant material is deposited between the number of metal lines and the substrate using a directional process. According to the teachings of the present invention, using a directional process includes maintaining a number of air gaps in the low dielectric constant material. Structures and systems are similarly included in the present invention.